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# The Lubrifate Salesman

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# *Memo for the Future*

## AIR CONDITIONING FOR PASSENGER CARS

By William Harrigan, Technical Division

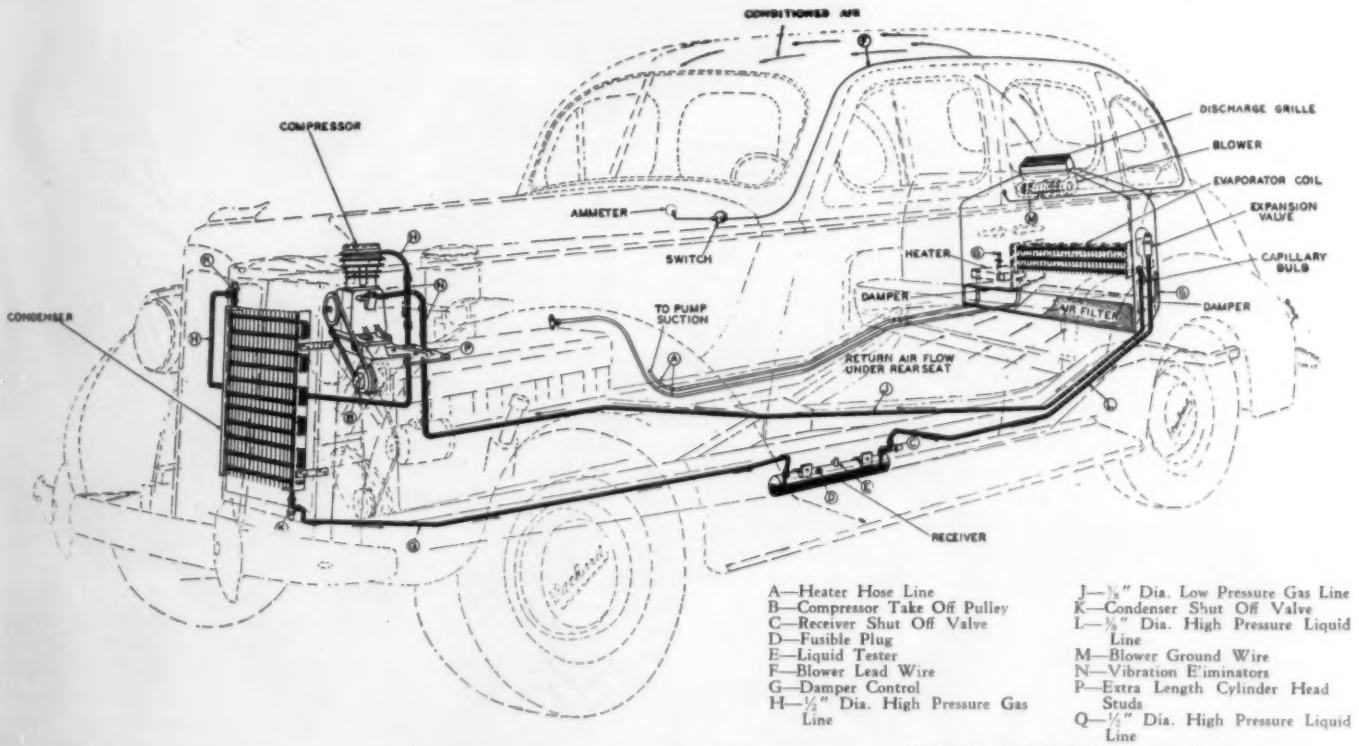
Courtesy The Texaco Dealer

The automotive industry has been marketing air conditioning apparatus for passenger cars in a limited way, as well as conducting extensive experiments on it. The several systems employed, which promise to become more popular with the introduction of 1941 automobile models, are typical of the one illustrated in the accompanying diagram.

This system is designed to filter the air and circulate it through the car, adding only such fresh air as enters through normal leakage. It is to cool the air by mechanical refrigeration, with automatic dehumidification in Summer; and warm it in Winter. The refrigerant is freon. The gas circulates through the closed system in the same way as in common household refrigerators, but of course with a much larger capacity than such refrigerators.

In a standard size automobile, heat absorption is said to be about 12,000 B.t.u. per hour when the car is running at 25 m.p.h. The compressor is driven directly off the engine and, of course, will run at various speeds, which, at 80 m.p.h. increases

*(Continued on Page 2)*




A—Heater Hose Line
B—Compressor Take Off Pulley
C—Receiver Shut Off Valve
D—Fusible Plug
E—Liquid Tester
F—Blower Lead Wire
G—Damper Control
H—½" Dia. High Pressure Gas Line
J—⅜" Dia. Low Pressure Gas Line
K—Condenser Shut Off Valve
L—⅜" Dia. High Pressure Liquid Line
M—Blower Ground Wire
N—Vibration E'iminators
P—Extra Length Cylinder Head Studs
Q—½" Dia. High Pressure Liquid Line

ILLUSTRATION COURTESY S.A.E. JOURNAL

TYPICAL AIR CONDITIONING SYSTEM LIKELY TO BE USED ON PASSENGER CARS SOON

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*(Continued from Page 1)*

the capacity of the cooling system to about 30,000 B.t.u. per hour. Unless the V-belt driving the compressor be removed, as it would be in Winter, the compressor runs continuously when the engine is running. The compressor is a two-cycle, reciprocating type and weighs about 31 pounds. It draws gas from the evaporator, being connected to this part by a copper tube, and delivers into a condenser through a tube of slightly smaller diameter. Both lines are connected by short lengths of flexible tubing designed to prevent the lines from receiving any vibration set up by the compressor or engine.

The air is fed in at the extreme rear of the car under the pressure difference set up by a pair of Sirocco blowers and is directed toward and along the roof of the car. Return flow is under the rear seat and thence through a filter into the housing which contains, in one compartment, an evaporator coil for cooling the air in Summer or in hot climates. In another compartment is a heating core, supplied with water from the engine jacket, for use in cold weather.

To take full advantage of the blast of cooling air set up by the engine fan and by the motion of the car, the condenser is placed between the grille and the radiator. This makes it possible to use a smaller condenser than would be required where there is less air flow and also makes it unnecessary to furnish a separate fan and fan drive. Being in front of the radiator, the condenser receives, of course, the coolest air available. Gas enters the condenser at the top and leaves as a liquid at the bottom, flowing thence through a pipe to a receiver mounted on the frame of the car below the left front door. From the receiver, the liquid flows through a pipe to an expansion valve to the evaporator coil, the valve being just outside the housing in which the coil is enclosed. This housing is against the forward wall of the luggage compartment and is roughly triangular in shape.

The left side houses the evaporator coils which cool the air drawn through them, and the right portion contains the heater core connected by hose lines to the engine jacket and pump. Dampers are provided to direct the flow through either compartment. At the bottom of the housing is a renewable air filter and, at the top, the pair of Sirocco blowers. Above the latter is a discharge grill just back of the rear seat, and so positioned as to direct the air upward and forward.

Shut-off, expansion, and other valves are similar to those used in commercial refrigerating systems. Aside from the dampers just mentioned and valves for controlling the flow of refrigerant in Summer and water in Winter, the only control required is a switch and rheostat on the instrument panel by means of which the blower motor can be turned on or off and speed can be regulated. This is the only control the car owner need operate as a rule, as the valve and damper settings will be changed normally in the service station when seasonal changes of lubricants are made and other Summer or Winter servicing is done.

# *1941 Presents*

## Still Better and More Beautiful Automobiles — Production and Deliveries on Full Scale — Many Lubrication Changes — Brand New Lubricants Hitherto Unknown

By J. Howard Pile, CHEK-CHART *Editorial Director*

Detroit, Sept. 23.—With most of the new 1941 car lines already announced and a few still to make their bows at this date, the automobile industry is in full swing for 1941.

Rumors of interruption or disruption of 1941 car schedules were bandied around, while the National Defense Program was before Congress, but these were quickly dissipated.

The automobile industry is all set to go right ahead with full-time production of 1941 car models and still take care of all the demands of the Government.

Of interest to the petroleum industry is the great number of changes in capacities, in recommendations, of new points added, changes in location, and so on.

Here are the highlights of lubrication changes on car models available at this date for study or on which information is permitted to be released by the factories:

American Bantam—Lines of small passenger cars and delivery models to carry through for 1941 with minor changes in lubrication instructions, which went into effect in the early summer, covering crankcase recommendations and shock absorber equipment.

Buick—New models featured by radical changes in carburetion and other engineering details. Many lubrication changes — a number of capacity changes over 1940. There is no Series 80 for 1941. Knee action at front end is radically redesigned on larger models. Reduction of some 12 points and addition of several others. Elimination of drag link which was previously lubricated from under the hood. Many other detail changes. New series are 40, 50, 60, 70, and 90 with same respective designations — Special, Super, etc., as before.

Cadillac—Although still veiled in secrecy at the moment, it is known that there will be outstanding changes in lubrication of these models, which will be known as Series 60S, 61, 62, 63, 67, and 75. Two of these series are entirely new, and for 1941 there is no present intention of building the V-16, of which a limited number were produced last year. The V-12 has not been built since 1937 so that the new Cadillac line will consist exclusively of V-eights. One of the new models will be in the medium priced field at the lowest price ever quoted on a Cadillac V-8. The La Salle line is being discontinued.

Chevrolet—The lines for 1941 will be the Master De Luxe (AG) and the Special De Luxe (AH). While general design, which has proved so satisfactory for 1940, is still the feature of the new cars, yet there are a number of changes of a minor nature from the lubrication standpoint. This year, production will be concentrated on the knee action models.

Chrysler—Fluid drive will continue to be one of the outstanding features of design with the application carried to a greater number of models. The Chrysler Six (C-28) will also have an entirely new type of transmission known as the Vacamatic which will require an entirely new lubricant. This lubricant has as yet no "name" but is to be made up of a highly refined, low viscosity, low pour point, compounded lubricant. The lubricant recommended is a highly refined mineral oil of the viscosity range of 20W Motor Oil with which has been compounded 10% of sulphur saponifiable base. The pour point is to be below the anticipated operating temperature. This will produce what is generally known as an extreme pressure lubricant. Extreme pressure lubricants are quite well known for gear lubrication purposes but this is the first time that any car manufacturer has recommended a lubricant of compounded motor oil for a transmission. Full and complete information and instructions will be issued later to cover these points in detail. The new transmission is a semi-automatic device which makes available to the driver starting, cruising and accelerating gear ratios without changing the position of the shifter lever. Lifting the foot from the accelerator pedal puts the gear in position.

# *The* INSTITUTE SPOKESMAN

*Published Monthly by* THE NATIONAL LUBRICATING GREASE INSTITUTE

GEORGE W. MILLER . . . *Editor*
498 Winspear Avenue, Buffalo, N. Y.

## *Correction*

In the article "An Improved Mobilometer" which appeared in the September issue of *Institute Spokesman,* the formula for calculating the consistency numbers which appeared at the bottom of the second column on page 2 should read

$$\frac{5000}{\sqrt[4]{L \times T}} \quad \text{instead of} \quad \frac{\sqrt[4]{L \times T}}{5000}$$

*(Continued from page 2)*

CROSLEY—Production of this line which reached about 2,000 in 1940 is to be sharply stepped up. Factory personnel has been augmented and additional experienced engineers and designers have been brought into the picture. Sales, previously in the hands of radio outlets, will now be made, in addition, by independent automobile dealers. The engine has been redesigned with larger bearings and has an improved oiling system. The original design wherein the flexible mounting of the engine served as the propeller shaft universal joint is now changed so that a separate universal joint performs that function. New model known as Model C.

DE SOTO—Included in the entirely new features of the De Soto line will be the availability of fluid drive and the use of an entirely new type of transmission known as the Simplimatic. This new transmission will require the same entirely new type of lubricant as called for on the Chrysler C-28. (Read Chrysler paragraph above.)

DODGE—The new series to be known as the Luxury Liner D-19. A number of detail lubrication changes are to be found and the use of fluid drive will also be extended to these models.

FORD—Models publicly announced Sept. 27. They will be the Ford De Luxe and the Ford Super De Luxe. Transverse springs are continued but the length has been increased, the period rate reduced, and a tension type shackle introduced to produce a softer, smoother ride. Specifications for the Special Ford Spring Lubricant have been revised to include a greater proportion of cup grease to increase the stiffness of the compound and prevent settling. (See separate item elsewhere in this issue giving new specifications.) Other detail changes in Ford lubrication will be provided later.

GRAHAM—1941 Hollywood models were announced around Aug. 1. These are much the same, so far as lubrication requirements are concerned, as 1940 models, with the exception of capacity changes and changes in tire pressures. Production has not started at Graham and no definite information can be secured pending refinancing operations.

HUDSON—While there are no revolutionary changes in design such as the introduction of independently sprung front wheels last year, these new cars with "Symphonic Styling" will call for some looking up on the part of the lubrication man. Several mileage intervals have been revised, graphite grease as a lubricant for brake cables has been superseded by chassis lubricant and the number and position of plugs on the transmission overdrive have been changed. The capacity of the conventional transmission has been reduced and tire pressures for several of the models have been sharply increased.

HUPMOBILE—Not in production at this time. Part of factory closed and negotiations with Graham for production of models held up pending refinancing operations of both companies. Graham produced a few of the Hupp Skylarks.

LA SALLE — Line discontinued in 1941. See Cadillac.

LINCOLN—New models are the Lincoln-Zephyr, Lincoln-Continental, and Lincoln-Custom. The Lincoln-Zephyr and Lincoln-Continental models carry through the style features of the current Lincoln-Zephyr line with a number of changes of all kinds and the Lincoln-Custom will fit into the place of the big Lincoln last made in 1939.

MERCURY—New models embody detail changes and also have springing revamped along the same lines as the Ford. New type Special Ford Spring Lubricant is recommended. See paragraph above on Ford and separate item elsewhere in this issue.

NASH—Outstanding member of the Nash family for 1941 is the new Ambassador 600 with which Nash enters the field of the cars in the lowest price class. Nash Ambassador 6 and Nash Ambassador 8 will continue to carry the banner in the larger car field. All three lines continue the use of independently sprung front wheels introduced on the Nash line last year and the 600 has coil springs front and rear. There are many detail changes about which more can be said later.

OLDSMOBILE—The center of interest of the lubrication men will naturally be in the Oldsmobile Hydra-Matic transmission which is continued as a design advance. While many features of the car have been radically changed and appearance enhanced, the lubrication features, with the exception of minor details, remain much the same as for the 1940 models. Models will be 60, 70, and 90. All of these chassis can be equipped with either 6 or 8 cylinder engines.

PACKARD—The new models are the Six (110), the One-Twenty, the Super Eight and the Custom Super Eight. There will be no Packard 12 which was last made in 1939. The clutch relay lever is now found on all 1941 models, whereas it appeared only on some of the 1940 cars. There are a number of changes in capacities and while the tire pressures remain much the same as before, the tire sizes are, in many cases, quite different.

PLYMOUTH — A number of lubrication changes are to be noted on the new 1941 Plymouth. A new lubrication point is the gear shift vacuum cylinder and linkage. Attention to this detail is recommended to be done by a car dealer as it involves information, tools and equipment not generally available elsewhere. The battery has been moved from under the seat to under the hood and there are a number of detail changes of location of lubrication points on various places around the car.

PONTIAC—There are many changes to be found in lubrication points and recommendations. The accelerating pump shaft on all 8-cylinder models is of the oil lubricated type. This was a design used only on the Torpedo 8 for 1940. The gasoline filler pipe has been moved from the right to the left side. Changes are made in air cleaner recommendations, tire pressures are changed, and there are a number of capacity changes. An entirely new feature is the built-in oil cleaner in the crankcase. All the oil passes through the cleaner and dirt and sediment settles to the bottom of the cup. No harm is done by flushing oil. An additional oil filter may be used if desired.

STUDEBAKER—The Champion, outstanding member of the Studebaker family for the past two years, continues its bid for a place in the lowest price car field. Also prominent in the line are the Studebaker Commander and the Studebaker President. A number of changes are to be found in all these models.

WILLYS—A new car with a new name, "Americar," which will not be announced till New York show time. It is understood that the car is to be a full sized model, in no sense a midget, and with a vast number of changes and improvements including hypoid gears.

### 1941 PONTIAC OIL CLEANER

The 1941 Pontiac is provided with an oil cleaner located in the crankcase. All of the oil passes through the cleaner at all times.

*(Continued on page 4)*

*(Continued from page 3)*

It consists of a fine mesh screen and settling cup at the intake end of the oil pump. Solid matter and sediment settles to the bottom of the cup. The cup never needs cleaning unless the car is turned over so as to spill the sediment. This type of oil cleaner may also be installed on earlier model Pontiacs. When a crankcase is drained and flushed with flushing oil, approximately one teacup full of the flushing oil will be trapped in the bottom of the cleaner. While this small amount of flushing oil may slightly dilute the newly added engine oil, the amount of flushing oil is not sufficient to be objectionable.

### Use of Lighter Oils

It has been proposed that, in the event of a national emergency, an attempt be made to restrict ground equipment to the use of SAE 10, 20 and 30 oils, the upper grades to be reserved for aviation.

### New Ford Spring Compound

While the springs used on the 1941 Ford and Mercury cars are practically the same as used on 1940 models they have been slightly increased in length, the period rate has been reduced and a tension shackle is used—all of which results in a softer and smoother ride.

This newly designed spring (which continues to be mounted transversely at the front and rear of the chassis) has a tendency to "pump" the former Ford Special Lubricant out from between the leaves where it is readily washed off by water thrown by the wheels. It, therefore, became necessary to increase the stiffness of the lubricating compound to overcome the difficulty.

The same ingredients are used as were used in Ford's former specifications, but that the lubricating grease has been increased, which increases the stiffness of the compound.

Oil companies who have made and stocked a supply of Special Ford Spring Compound made to meet the former Ford specifications are advised to use up their present stock. Due to its fluidity, as compared to the compound built to meet the new specifications, it may be necessary that the springs be lubricated at more frequent intervals than every 1,000 miles, if the old style lubricant is used in 1941 springs.

The new compound can, of course, be used for lubricating older model springs.

Briefly the recent history of Ford spring leaf lubrication is this:

During 1936 a spring having leaves grooved lengthwise was adopted for both Ford and Lincoln-Zephyr passenger cars. A lubrication fitting was provided. Ford specified a special lubricant which would provide just the proper frequency rate and the proper flexibility. The specification for this lubricant was revised in 1937 and now again in 1940.

Starting with 1940 models, all Mercury, some models of the Ford V-8 and some models of the Lincoln-Zephyr adopted spring covers. These covers are used only on those springs having the tie bolt lubricator fitting and the grooved leaves as outlined above. Springs having covers are lubricated the same as other grooved leaf springs. The covers help keep the lubricant in place and prevent water, grit, dirt and corrosive chemicals used to melt snow or lay dust, from between the leaves.

Starting with 1940 production, some Lincoln-Zephyr body types are equipped with springs having rubber inserts between the leaves. These springs are not equipped with either spring covers or with the tie bolt lubricator fitting.

Rubber insert type springs must not be sprayed or otherwise lubricated.

These springs are easily identified by the circular bulge near the end of each spring leaf which accommodates the rubber insert.

### Automobile Shows

Oct. 12-10—New York, Los Angeles.
Oct. 12-19—Detroit, Rochester, N. Y.
Oct. 19-26—Pittsburgh, Buffalo, Newark, N. J., Baltimore, Washington, Indianapolis.
Oct. 20-26—St. Louis, Portland, Maine.
Oct. 26-Nov. 3—Chicago, San Francisco.
Oct. 26-Nov. 2—Milwaukee.
Oct. 29—Nov. 3—Omaha.
Nov. 4-9—Grand Rapids, Mich.
Dec. 2-7—Tulsa, Okla.

—Automotive News, Sept. 23, 1940

## *Highlights of the Institute's 8th Annual Meeting*

In opening the convention, E. V. Monerieff traced the progress of the Institute since its organization. He discussed the use of the institute emblem urging members to employ it on letterheads and printed matter. It is not to be used on labels and packages, however.

E. S. Glauch, Joseph Dixon Crucible Co., spoke at the opening session on "Graphite—Its Use in Lubricants". His comprehensive discussion stressed the point that the nature of the impurity as well as the percentage of impurity in graphite governs the value of graphite in lubricants. He pointed to its ability to fill the pores of bearings and to provide a film which resists pressures higher than oil or grease to explain the effectiveness of graphite as a lubricant. He stressed the savings in power which can be effected thru the use of high grade graphite products in various types of operation.

Problems met by grease makers in various sections of the country were discussed in an open forum during the afternoon session. Past Presidents of the institute led the discussions.

J. R. Battenfeld, first president of the institute, spoke on "Mechanization Applied to Agriculture" beginning with the period when axle grease alone constituted the farm market and tracing the development of that market to its present status in which greases of every description must be supplied to lubricate 1,820,000 tractors as well as other farm machinery and millions of farm cars and trucks.

W. H. Saunders, Jr., International Lubricant Corp., spoke on the subject "Industrialization of the South". His vivid picture of rapid development since 1917 stressed the growing importance of the Southern market for lubricants.

M. R. Bower, Standard Oil Co. (Ohio), discussed "The Transition in the Iron and Steel Industry". His talk stressed the magnitude of the problem which has faced the grease manufacturer in keeping pace with the phenomenal development in steel mill equipment during the past ten years. Only thru constant research and careful study of requirements has the efficient operation of the modern equipment been made possible.

Homer F. Wilhelm, Socony Vacuum Oil Corp., gave an enlightening talk on public and employee relations.

George W. Miller, executive secretary of the institute, from the border city of Buffalo, spoke on the new trade possibilities with our Canadian neighbors which have arisen from the vast industrial expansions in Eastern Canada.

M. B. Chittick, The Pure Oil Co., pointed to the rapid development of mechanical equipment as a challenge to the grease maker to modernize grease making technique and to produce lubricants adapted to the new mechanical requirements.

*Copies of Mr. Glauch's talk can be obtained at a cost of ten cents each to cover handling and mailing. Address the Executive Secretary, 498 Winspear Avenue, Buffalo, N. Y.*

LUBRICATE FOR SAFETY EVERY 1000 MILES